



# Spec E46

## Official 2021 National Rules

(Rules subject to change)

Nov. 30, 2020, Version 2.8

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(Note: Latest revisions are in **blue** font, and all previous revisions are in **green**)

### 1. **Introduction**

Spec E46 is a road racing class based on BMW's E46 chassis that emphasizes high performance, vehicle consistency, reasonable cost, and ease of entry in order to provide a highly competitive, driver-focused racing experience.

### 2. **Intent**

Spec E46 is a spec racing series combining vehicle equality with a high level of chassis performance and adjustability to maximize driver involvement. Engine development above a stock power level is not included in the intent of Spec E46.

### 3. **Sanctioning Body**

The National Auto Sport Association (NASA) sanctions Spec E46 competitions. All events are governed by these regulations, applicable addendums, as well as those found in the latest version of the NASA Club Codes and Regulations (CCR). All decisions made by the series administrators are final, except under certain conditions, as specified by the CCR.

#### **4. Vehicle Eligibility**

The series is open to BMW E46-chassis 330 US domestic market (USDMM) models. This includes 2001-05 sedans and 2001-06 coupes. ZHP, 330xi, wagon, and convertible models are not permitted. A 323/325/328 chassis may be used provided all components meet 330 specs.

#### **5. Safety**

5.1 All safety requirements shall follow NASA standards as detailed in the CCR. If the Spec E46 rules and CCR differ the Spec E46 rules shall supersede the CCR.

5.2 Airbags must be removed.

5.3 Glass sunroof must be removed and replaced with a metal or composite panel securely attached to the roof.

5.4 The roll cage must be of the standard six point design, or a 6+2 design with an additional two bars and associated chassis attachment points added for foot protection, provided that the foot protection bars do not go through the front firewall. Cars may utilize OEM type steering column and transmission tunnel attachment points to the dash bar if equipped. A driver seat mounting cradle integrated into the cage structure may attach to the chassis at the transmission tunnel at two points, each with a maximum mounting surface of 40 sq in. Factory brackets 41118239493 and 41118233493 may be modified or removed but may not provide additional attachment points. No additional tabs or attachment points are permitted.

#### **6. Definitions and Defaults**

6.1 Cars must compete as equipped by the manufacturer, except as permitted by these regulations.

6.2 Addition, removal, modification, or disabling of parts is not permitted unless specified.

6.3 OEM equivalent parts may be used provided they do not provide a performance advantage over stock.

6.4 'Replaced' means that parts may exceed OE specifications, provided they are mounted in the stock location and perform the same function.

6.5 If a part may be removed any related brackets, fasteners, electrical components, etc may also be removed.

## **7. Dyno Testing**

7.1 Fuel must be pump gas rated 93 octane or lower.

7.2 All lubricating and hydraulic fluids may be replaced.

7.3 All filters may be replaced.

7.4 Minimum vehicle weight is 2850 pounds with driver.

## **8. Graphics**

8.1 Front fenders are reserved for sponsor and other required stickers.

8.2 The area above each wheel is reserved for the tire sponsor.

## **9. Engine**

9.1 Regardless of factory specification or procedure, no oversize pistons are permitted.

9.2 Compression ratio may be changed only within the tolerances affected by resurfacing for trueness and within factory tolerances.

9.3 Time-Sert or similar product may be used with threaded components.

9.4 Head and rod bolts may be replaced.

9.5 Oil pan baffle may be added.

9.6 Spark plugs may be replaced.

9.7 Head gasket may be replaced with any gasket having the same or greater compression thickness as stock. Other engine gaskets and seals may be replaced.

9.8 Stock oil pump assembly may be modified.

9.9 Oil separator (CCV system) may be replaced.

9.10 Oil filter housing may be replaced or an adapter plate installed to add an oil cooler. Minor clearancing that does not affect performance allowed if needed for fitment. Remote oil filter housing is not allowed.

9.11 Engine must be controlled by a MS43 ECU flashed with the Epic Motorsports Spec E46 tune. The Epic tamper proof seal must be intact. Cars equipped with MS45 ECU must replace the ECU and related components with MS43 compatible parts.

9.12 Emissions related equipment may be removed.

9.13 An engine oil accumulator may be used.

9.14 Output may not exceed 225whp as measured by a dynamometer (see appendix A).

## **10. Engine Bay**

10.1 Engine accessory belts may be replaced.

10.2 Pulleys may be replaced with metal versions of the same diameter.

10.3 Windshield washer system may be removed.

10.4 Power steering hoses and reservoir may be replaced and/or relocated.

10.5 Horn may be removed.

10.6 All HVAC components may be removed.

10.7 Fittings, adapters, senders, and sensors for monitoring or data acquisition systems may be added.

## **11. Cooling System**

11.1 Radiator may be replaced provided it retains the mounting points, plane of orientation, and requires no body or structure modification to install.

11.2 Electric fan may be replaced, mechanical fan may be removed.

- 11.3 Extraneous coolant hoses may be removed or plugged.
- 11.4 Coolant hoses may be replaced or reconfigured.
- 11.5 Thermostat may be replaced or an alternate configuration used.
- 11.6 Water pump may be replaced, provided it remains mechanically driven.
- 11.7 Alternate coolant expansion tank may be installed [and/or relocated](#).
- 11.8 Ducting or sealing materials may be used to route air through the radiator, provided they are inside the bumper cover and serve no other function.
- 11.9 Oil coolers for engine, transmission, and differential are allowed.

## **12. Exhaust System**

- 12.1 Exhaust system provided by BimmerWorld, 1004184 Race Exhaust and 1004187 Y-pipe, must be used.
- 12.2 Exhaust must mate to factory OBD2 E36 exhaust manifolds, part number 11 62 1 744 250 and 251.
- 12.3 Air injection ports may be welded/filled and ground.
- 12.4 The manifolds may be coated or wrapped with heat resistant material.
- 12.5 Unmodified stock exhaust may be retained if the spec exhaust is not installed.

## **13. Drivetrain**

- 13.1 Either the 5 or 6-speed E46 330 manual transmission may be used.
- 13.2 Flywheel and clutch assembly may be replaced provided they use the stock hydraulic actuating mechanism. Clutch must be a single disc type.
- 13.3 Shifter mechanism may be replaced or modified provided it retains the original H-pattern.

13.4 Motor and transmission mounts may be replaced provided they are no more than 10mm shorter than stock.

13.5 Upgraded differential is permitted using a 3.46 gear ratio, factory housing, flanges, and mounting points. The internal parts of the differential are otherwise unrestricted, including the use of limited slip units.

13.6 A stock 2.93 differential may be used. It may be welded but no other modifications allowed.

13.7 Finned and/or larger capacity differential cover may be used.

13.8 Differential bushings may be replaced.

#### **14. Suspension**

14.1 Shocks must be MCS non-remote reservoir single-adjustable (1WNR). OE bump stops in stock configuration may be used.

14.2 Front springs must be Hyperco 6" 2.25" ID 750# part number 186A0750.

14.3 Rear springs must be Hyperco 5" 2.25" ID 850# part number 185A0850.

14.4 Swaybars may be replaced provided they use stock mounting locations with non-metallic bushings and either individual hole or sliding collar adjustment. Remote-adjustable or pivoting blade bars are not permitted.

14.5 Swaybar links may be replaced.

14.6 Adjustable camber/caster plates are permitted. The three front strut mounting holes and center hole may be notched/trimmed to provide clearance for fitment or achieving full range of adjustment.

14.7 Any OE-spec E46 non-M3 front control arm may be used.

14.8 Front control arm bushings and housings may be replaced. Spherical or ball joint design not permitted.

14.9 Rear upper shock mounts may be replaced.

14.10 Rear trailing arm bushings may be replaced. Spherical or ball joint design not permitted. Limiters may be added.

14.11 Height adjustable rear spring adjusters may be added.

14.12 Rear lower control arms may be replaced.

14.13 Rear lower control arm bushing may be replaced with BMW part number 33 32 6 775 551.

## **15. Tires and Wheels**

15.1 Wheels may be replaced, 17" diameter and maximum width 9".

15.2 Effective offset (wheel + spacer) minimum of 27mm front, 38mm rear.

15.3 Minimum wheel weight is 16.2 pounds.

15.4 Wheel studs and lug nuts may be added.

15.5 Wheel spacers may be used.

15.6 Toyo RR 255/40-17 is the required tire.

15.7 Toyo RA1 235/40-17 may be used instead of the RR.

## **16. Brakes**

16.1 Brake pads may be replaced.

16.2 Brake rotors may be replaced provided they are one piece steel.

16.3 Dust shields may be removed or replaced.

16.4 Flex lines may be replaced.

16.5 Brake caliper guide bushings may be replaced.

16.6 Parking brake may be removed.

16.7 Two openings in the front valance to allow the passage of up to a three inch diameter duct leading to each front brake are permitted. Ducts may be sealed or blocked off.

## **17. Body and Chassis**

17.1 Bumpers must be USDM OEM or non-M3 fitment replica of USDM M3.

17.2 Factory rear trunk lid spoiler must be removed if installed.

17.3 Engine under-tray panels may be removed or replaced with flat material no larger than the factory panel.

17.4 Additional front bumper support may be added provided it serves no other function.

17.5 Fenders may be rolled inside for clearance but can not be visibly or measurably altered on the outside profile or width.

17.6 Non-metallic inner fender liners may be removed.

17.7 Screening of 1/4" minimum mesh may be added over all openings in the front of the vehicle, contained entirely with the bodywork of the vehicle.

17.8 Side moldings, side reflectors, etc may be removed and attachment holes may be filled.

17.9 Hood and trunk pins, clips, or positive action external latches may be added. If alternate parts are used the stock releases and components may be removed.

17.10 Chassis reinforcements for the rear subframe, rear trailing arm pocket, front subframe, front strut towers, and sway bar mounts may be added.

17.11 Front strut tower brace may be added provided it attaches only using the three factory strut top stud locations.

17.12 Rear subframe bushings may be replaced.

17.13 Transmission cross member support may be replaced.

17.14 Both driver and passenger front side windows may be removed. Side windows to the rear of the B-pillar may be permanently fixed in position.



17.15 Secondary fuel pump to minimize fuel starvation may be installed. The secondary fuel pump must be located in the fuel tank and have no other function. The M3 fuel pump baffle 16 11 2 229 656 may also be used.

17.16 Fuel filler neck may be modified, relocated, or replaced provided the fuel tank and capacity are unchanged.

17.17 Battery may be replaced and/or relocated provided the positive terminal is properly insulated.

17.18 Ballast allowed per the CCR.

17.19 Headlights may be replaced with any complete, commercially available, functional headlight assemblies. Ballast may be removed from Xenon/HID lights. Bulb assemblies may be replaced by additional light sources within the stock housings.

## **18. Interior**

18.1 All non-essential hardware and material in the interior and trunk may be removed. This includes carpeting, headliner, sound and thermal insulation, lighting, HVAC components, audio systems, passenger and rear seats, seat belts, trim pieces, tools, spare wheel/tire, storage compartments.

18.2 Unibody structure (including rear parcel shelf) may not be modified or removed unless otherwise specified.

18.3 Trunk lid inner support structure may be removed provided function and external appearance is not compromised.

18.4 Stock dash must be retained. The portion of the dash extending below the middle trim strip may be modified or removed. The factory dash support may be removed.

18.5 Steering wheel may be replaced and a quick release added.

18.6 Driver side dead pedal/foot rest and pedal covers may be added.

18.7 The stock instrument cluster may be removed and replaced with a panel suitable for

mounting gauges. Areas directly behind the gauge panel may be modified/trimmed to accommodate gauge mounting.

18.8 Driver and passenger outside mirrors may be removed, modified, or replaced provided that side mirror functionality is retained. Interior rear view mirror may be replaced.

18.9 Inner door panels may be removed. If front door retains door glass and window regulators, interior door panels must be replaced with aluminum sheeting of 0.060-inch or thicker or comparable shatter-proof material, securely attached to the door.

18.10 Rear bulkhead panel on non-folding rear seat cars may be cut out.

18.11 Aesthetic panels or covers may be added provided they are not welded or structurally mounted.

18.12 Interior door steel panels may be removed along with window regulators and lock mechanisms.

18.13 Driver's door must be capable of being opened from both inside and outside the car.

18.14 Rear side glass (coupe) or door glass (sedan) may be replaced with polycarbonate provided it retains factory appearance. Ducts for driver comfort may also be utilized in these locations.

18.15 Turn signal, headlight, and windshield wiper stalks may be modified, removed, or replaced with alternate switches located elsewhere in the driver compartment.

18.16. Accessories including but not limited to gauges, dash systems, cool suits, helmet blowers, data acquisitions systems, video capture systems, two-way radios, and associated equipment are permitted, provided that such accessories are properly secured.

## **Appendix A – Dynamometer procedure**

The following was provided by NASA and is intended for use at NASA sanctioned events.

1. To ensure objectivity, a SpecE46 Series official, an appointed official, or an approved technician will operate any cars being inspected on the chassis dynamometer. Three consecutive "official" dyno pulls must be performed and the highest result of the three pulls in each category or HP and Torque (rounded to the nearest tenth) will be used for compliance. NASA, its officers, officials, and assigns are not responsible for any mechanical failures or damage otherwise while the dyno runs are being performed.
2. The DynoJet brand is the required type of dyno for testing and inspection. All dyno readings must be corrected to SAE J1349 Rev JUN901 and the dyno's smoothing function set to 5.
3. Prior to the chassis dynamometer inspection, the competitor may top off any fluids needed to ensure the engine and drivetrain are not damaged during testing. The fluids must be added with a NASA Technical Inspector present and no other modifications or adjustments may be made to the car.
4. All dyno pulls will be made with the hood opened.
5. Prior to the first official run, an official or technician will confirm that the accelerator pedal opens the throttle completely.
6. Dyno pulls will be made in 4th gear.
7. During an official dyno test, the car must be fitted with the tires used on the car in the previous session with the rear tire pressures set at 35 psi.
8. Electric engine fans and or external cooling fans and externally operated water misters may be used while the car is on the dyno.
9. Dyno runs shall be made with water temperature in the normal operating range of 165F-230F and drivetrain fluids up to a normal running temperature. Should the water temperature exceed 230F during any pull, that pull is void and shall be repeated once the engine has cooled enough to operate within the specified range. Water temperature may be verified using external temperature measurements such as an infrared temp gun at the thermostat housing
10. Three consecutive runs shall be made under full power. The RPM range shall be consistent for all three runs. Starting RPM shall be no higher than 2000. Ending RPM shall be when the rev limiter engages at approximately 6500 rpm.